

Epi Notes



North Carolina Department of Health and Human Services ♦ Division of Public Health

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Dr. Leah Devlin Named State Health Director

Prepared by Angela Green, Office Assistant, Epidemiology Section



DHHS Secretary Carmen Hooker Odom announced Dec. 13 that Leah Devlin, who had been Acting State Health Director since May, has agreed to stay on in that capacity and to serve as director of the N.C. Division of Public Health.

Dr. Devlin began her public health career in 1979 as a clinical dentist. She then spent 10 years as Wake County health director, and in 1996 joined the State Health Director's Office as deputy director. She has since served in various positions at the state level.

Dr. Devlin has an undergraduate degree, a masters degree in public health and a dental degree from the University of North Carolina at Chapel Hill.

Join us in welcoming Dr. Devlin to this new role! ■

The State Laboratory of Public Health and the Anthrax Crisis

*Prepared by Royden Saah, Bioterrorism Specialist
State Laboratory of Public Health*

The North Carolina State Laboratory of Public Health (NCSLPH) responded early to the nation's anthrax crisis when it analyzed possible contamination sources that the index (first) case may have been exposed to while the man was traveling in North Carolina several days prior to his death.

As anthrax incidents multiplied, a panicked public swamped the state laboratory with everything from legitimate threat letters containing powder to detergent spilled onto a bathroom floor. In the weeks and months following the first response, the NCSLPH received and analyzed hundreds of environmental and clinical specimens sent in by law enforcement agencies, hospitals and local health departments.

The multitude of preparations the laboratory had already made for a bioterrorism event enabled us to respond more effectively to the flood of samples received in October and November.

Well before the assault of last October, the laboratory had started preparing for a biological weapons attack. These preparations included the building and equipping of a Biological Safety Level - 3 (BSL-3) laboratory, capable

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of containing organisms that cause such diseases as anthrax and bubonic plague. In October 2000, the NCSLPH sent a laboratorian to the Centers for Disease Control and Prevention (CDC) in Atlanta for specialized training in the detection of bioterrorism agents. In July 2001, selection began for a dedicated laboratory specialist to staff the bioterrorism lab.

Microbiology Basics

When a suspected anthrax sample comes into the laboratory, it is logged in as evidence and handled with a strict chain of custody to support any prosecution that may arise. In the BSL-3 lab, the sample is opened inside a Biological Safety Cabinet and placed on microbiological media to support the growth of *Bacillus anthracis* (the causative agent of anthrax). Any bacterial colonies with physical characteristics that resemble the anthrax bacterium then undergo more advanced analyses to either rule out or positively identify *B. anthracis*. These tests may include exposing the suspect organism to a bacterial virus (bacteriophage) that only affects the anthrax bacterium. Lab specialists may also check for certain molecules in the bacterial cell wall and capsule that are very specific to *B. anthracis*.

In November 2001, the laboratory received a real-time polymerase chain reaction (PCR) instrument. The LightCycler® enables us to amplify and detect the DNA from *B. anthracis* cells or spores initially without the use of conventional microbiological methods. We were able to use this equipment to make the detection of *B. anthracis* more efficient during the latter part of the anthrax event.

Statistics

Of the hundreds of samples received, some did not require any analysis (i.e., law enforcement requesting only to hold or destroy

the sample) and some required many analyses (i.e., scores of swabs associated with the investigation and cleanup operations of U.S. Postal Service facilities). From the second week in October 2001 to the week ending March 16, 2002, the laboratory received well over 50 clinical isolates with the request to rule out *Bacillus anthracis*. During that same time period, we received 453 environmental samples requiring 709 analyses. Comparing the sample load during the crisis to the four (4) bioterrorism samples received during the previous two years represents more than a 1400-fold increase to our sample load. As shown by the table on page 3, the more populous regions of the state required more effort on the part of the laboratory.

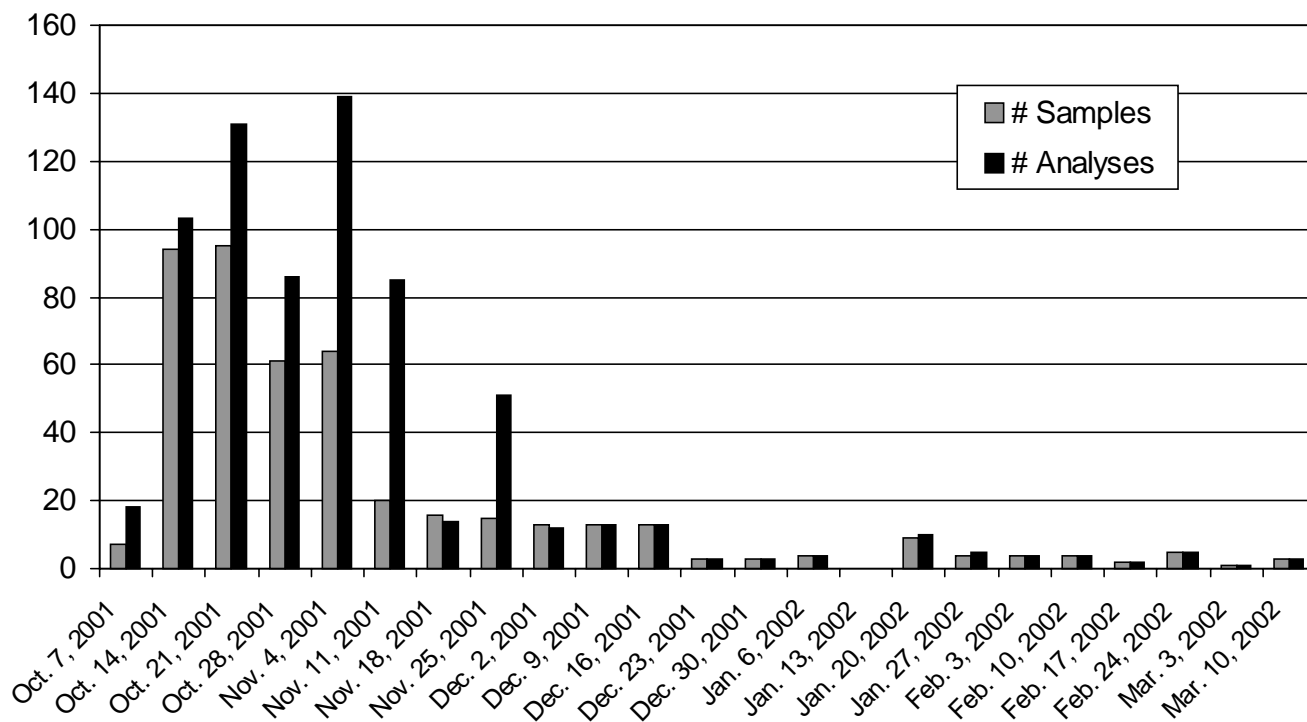
Of the 709 analyses performed, one yielded a positive result: a swab taken at a Raleigh postal center downstream of the Brentwood facility in Washington, D.C. The contamination was slight; of the 42 swabs taken at the postal center, only one swab yielded one colony of the bacteria. Followup testing *prior* to cleanup efforts detected no other contamination on the 26 additional environmental swabs taken.

Conclusion

Though it took numerous personnel many long hours, advance planning enabled the N.C. State Laboratory of Public Health to respond to the anthrax crisis without extreme loss of productivity. Additional measures are being implemented to expand the state's ability to respond to such events. Those measures include building a second BSL-3 lab, creating three regional labs (one each in Buncombe, Mecklenburg and Pitt counties), and adding six personnel to the bioterrorism staff for the regional and central labs.



Number of BT Samples and Analyses Performed, by Week



**Bioterrorism Environmental Samples*: Number of Specimens Received
and Analyses Performed by State Laboratory of Public Health, by County
Oct. 7, 2001 - March 16, 2002**

County	No. Specimens	No. Analyses	County	No. Specimens	No. Analyses
Out-of-state	1	18	Hoke	1	1
Alamance	24	22	Hyde	1	3
Alexander	9	9	Iredell	11	12
Anson	1	2	Jackson	2	2
Ashe	3	3	Johnston	10	10
Beaufort	6	6	Jones	1	1
Bladen	2	2	Lenoir	1	1
Brunswick	2	2	Macon	1	1
Buncombe	4	4	Mecklenburg	24	95
Burke	6	6	Montgomery	3	3
Cabarrus	10	14	Moore	1	1
Camden	1	1	Nash	17	17
Carteret	5	5	New Hanover	1	1
Caswell	10	10	Onslow	3	3
Catawba	2	2	Orange	10	10
Chatham	1	1	Pamlico	1	1
Cherokee	3	2	Pasquotank	3	3
Chowan	2	2	Person	2	2
Cleveland	19	17	Pitt	9	9
Craven	4	5	Polk	1	1
Cumberland	13	16	Randolph	28	28
Dare	2	2	Richmond	5	4
Davidson	12	13	Robeson	21	21
Davie	1	1	Rockingham	2	2
Duplin	2	2	Rowan	1	1
Durham	11	11	Sampson	1	1
Edgecombe	3	3	Stokes	5	3
Forsyth	1	1	Surry	5	6
Gaston	1	1	Transylvania	1	1
Greene	2	2	Union	3	5
Guilford	13	33	Vance	2	2
Halifax	2	2	Wake	77	208
Harnett	5	5	Watauga	1	1
Haywood	1	1	Wayne	4	4
Henderson	3	3	Yadkin	2	2
Hertford	4	4	Yancey	1	1

*Total specimens received 453; total analyses 709. Some samples contained multiple sub-samples, which were analyzed separately. Some samples received were not analyzed for various reasons (contamination; improper procedures; sampling request withdrawn; etc.).

New Biologic Agents Registry

*Prepared by Paul Webb, Industrial Hygienist
Office of Bioterrorism Coordination
Occupational & Environmental Epidemiology Branch*

In response to last fall's anthrax attacks and the continuing threat of possible biological terrorism (BT), the General Assembly has passed a law requiring the registration of potentially dangerous biological agents in North Carolina. Effective January 10, 2002, the State of North Carolina now requires that any organization or individual who possesses and maintains a biological agent listed as a select agent in Federal Register 42 C.F.R. Part 72 must notify the Office of the North Carolina BT Coordinator.

The information that is reported to the Office of the BT Coordinator is strictly confidential and can only be released by order of the State Health Director if that information is necessary for the investigation of a disease outbreak or for the investigation of a release, theft or loss of a biological agent.

Compliance information and the reporting form have been mailed out to hospital labs, pharmaceutical firms and potential reporters. They are also posted on the N.C. Epidemiology web site at www.epi.state.nc.us/epi/bioagent.

Some of the agents listed, including anthrax, are also naturally occurring diseases and may be identified as a part of the clinical management of patients. Biologic agents identified during clinical diagnosis in N.C. are exempt from the registry reporting requirement. However, such cases may be reported to the General Communicable Disease Control Branch (919-733-3419). (For a list of reportable diseases, see the Communicable Disease Control website at www.epi.state.nc.us/epi/gcdc.html.)

For further information, contact Dr. Steve Cline, Office of the BT Coordinator, Epidemiology Section, N.C. Division of Public Health, 1902 Mail Service Center, Raleigh NC 27699-1902, (919) 733-3421. ■

Update on the Division of Public Health's Bioterrorism Risk Reduction and Response Efforts

*Prepared by Paul Webb, Industrial Hygienist
Office of Bioterrorism Coordination
Occupational & Environmental Epidemiology Branch*

This country's recent experience with anthrax attacks through the mail system marks a new era in efforts to protect the public's health. Bioterrorism is no longer a theory or a tabletop exercise—it is reality. For the first time in over a decade, public health is front-page news. Neglected for most of the 20th century, the U.S. public health system has quietly worked to keep contagious diseases in check. The attacks brought public health to the forefront and illustrated the need to redesign and strengthen the nation's capacity to protect public health in a time when biological agents are being deployed against the people of this nation and, potentially, our own state.

Last fall, the Division of Public Health proposed a plan to respond to the threat of bioterrorism. Entitled "Bioterrorism Risk Reduction and Response," it was approved by Governor Easley's Terrorism Task Force in November, 2001. The plan will increase and improve (continued on page 5)

REPORTABLE AGENTS LIST

The biological agents that are reportable under North Carolina law are the select agents listed in Federal Register 42 C.F.R. Part 72, Appendix A. The DHHS (CDC) maintains this list of select agents, which can be found on their website at

www.cdc.gov/od/ohs/lrsat/42cfr72.html

Viruses

1. Crimean-Congo haemorrhagic fever
2. Eastern equine encephalitis
3. Ebola
4. Equine morbillivirus
5. Lassa fever
6. Marburg
7. Rift Valley fever
8. South American hemorrhagic fever
9. Tick-borne encephalitis complex
10. Variola major virus (smallpox)
11. Venezuelan equine encephalitis
12. Hantavirus pulmonary syndrome
13. Yellow fever

Bacteria

1. Bacillus anthracis
2. Brucella abortus, B. melitensis, B. suis
3. Burkholderia (Pseudomonas) mallei
4. Burkholderia (Pseudomonas) pseudomallei
5. Clostridium botulinum
6. Francisella tularensis
7. Yersinia pestis

Rickettsiae

1. Coxiella burnetii
2. Rickettsia prowazekii
3. Rickettsia rickettsii

Fungi

1. Coccidioides immitis

Toxins

1. Abrin
2. Aflatoxins
3. Botulinum toxins
4. Clostridium perfringens epsilon toxin
5. Conotoxins
6. Diacetoxyscirpenol
7. Ricin
8. Saxitoxin
9. Shigatoxin
10. Staphylococcal enterotoxins
11. Tetrodotoxin
12. T-2 toxin

Recombinant organisms/molecules

Genetically modified microorganisms or genetic elements from organisms on this list.

For a complete list of agents and exemptions, please refer to the website.

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capacity for both epidemiologic surveillance and laboratory analysis of highly hazardous biological agents. This effort is being funded through a combination of existing resources, federal grants, and the Governor's Terrorism Defense Funds.

Under the direction of Acting State Health Director Leah Devlin, a BT Steering Committee was established to implement the plan. The committee structure is divided into twelve categories, or project areas, in order to address each aspect of implementation. A project chair is responsible for each of the project areas, such as regional teams development, laboratory capacity, information technology, epidemiologic surveillance, and state-level team development. The Division of Public Health has relied on existing partnerships with local health departments, and their assistance has been an essential component of this plan.

The administration of this effort will eventually fall to the BT Coordinator, who will be a medical expert on BT and work out of the Office of the BT Coordinator. The BT Coordinator will work closely with the seven regional epidemiologic surveillance teams and the BT Steering Committee. Dr. Steve Cline, chief of the Epidemiology Section, is currently serving as the interim BT Coordinator and is managing all aspects of the plan through the BT Steering Committee.

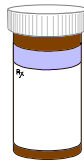
The four major goal areas of the BT plan are to:

- 1) Strengthen the statewide public health system to detect and respond to acts of terrorism by establishing seven **Regional Bioterrorism Surveillance Teams** in seven host local health departments (Buncombe, Cumberland, Durham, Guilford, Mecklenburg, New Hanover and Pitt);
- 2) Build the capacity and expertise of the **State Level Bioterrorism Team**;
- 3) Expand the capacity of the **State Laboratory of Public Health** to perform the laboratory analysis for agents of bioterrorism; and
- 4) Build the statewide **Information Technology System** for electronic communication (Health Alert Network), laboratory results (Laboratory Information Management System) and communicable disease reporting (National Electronic Disease Surveillance System).

To date, good progress has been made toward implementation of all project areas. The immediate objective of having statewide coverage has been achieved through the establishment of interim lead public health contacts for each of the seven regional teams and by establishing an interim BT Coordinator and BT Implementation Steering Committee. While the focus has been on the threat of bioterrorism, the investment in our state's public health system will benefit the everyday life of all North Carolina citizens long into this new century. ■

Closure of the N.C. AIDS Drug Assistance Program

Prepared by Steve Sherman, AIDS Policy/Advisory Coordinator, HIV/STD Prevention and Care Branch



Dramatically rising costs have forced the North Carolina HIV Medications Program, also referred to as the AIDS Drug Assistance Program (ADAP), to stop accepting new clients as of Dec. 15, 2001. ADAP uses a combination of state and federal funds to provide eligible low-income residents of the State with assistance in purchasing medications to fight HIV/AIDS and the opportunistic infections which often accompany the disease.

The utilization and expenditure patterns of the ADAP Program have changed significantly over the past year, with expenses nearly doubling in the first half of this fiscal year as compared to the last fiscal year. During the first six months of SFY 2002, the monthly expenditure has been approximately \$1.89 million, up from about \$945,000 per month for the same six-month period last year.

The primary cause of this marked increase in spending is that the utilization of the Program has increased dramatically – from an average of about 35 percent of eligible clients using the Program monthly in the first six months of SFY 2001 to almost 55 percent of eligible clients obtaining their life-sustaining medications monthly for the same six-month time period in SFY 2002.

The best explanations for these significant changes/increases are:

- The recessionary economic situation in the state and country has lead to significant job layoffs and cutbacks, resulting in an “across-the-board” increased demand for public program support and services, as well as more aggressive billing and collection efforts on the part of providers and reduced access to other public third-party payors.
- Expanded and improved HIV medication options are available to clinicians and patients, resulting in more patients remaining on medications for longer periods of time. Increased efforts to improve patients' adherence to their medications has also contributed to increased utilization of the medications and the Program.

As a result of the above situation, the ADAP Program has been forced to take the following actions:

- Effective December 15, 2001, cease to authorize any additional clients for the ADAP Program during FY 2002. **All authorized clients will continue to be served!**
- Maintain financial eligibility at 125 percent of the FPL until funding permits an increase; and
- Establish a waiting list – to be maintained in the Office of Purchase of Medical Care Services – of those determined to be eligible for ADAP. Individuals will be drawn from this list and added to the Program when and if future analyses demonstrate that they can be added within the funds available to the Program.

The Program deeply regrets having to take this action. If you have any questions, please contact Steve Sherman at (919) 715-3111 or by e-mail at steve.sherman@ncmail.net. ■

Problems Associated with Newly Recommended Short Course Therapy for Latent Tuberculosis

Prepared by Ashley Ewing, TB Health Educator, and Carol Dukes Hamilton, M.D., N.C. TB Medical Director General Communicable Disease Control Branch

Between February 12 and August 24, 2001, 21 cases of liver injury were reported to the CDC associated with the rifampin (RIF) and pyrazinamide (PZA) two-month regimen for treating latent tuberculosis infection (LTBI). Based on clinical and laboratory findings consistent with hepatitis, the patients were determined to have liver injury. Sixteen of the 21 patients recovered from RIF-PZA-associated liver injury and the remaining five died as a result of liver failure. Unfortunately, there is no denominator data on which to calculate the adverse event rate, and it has been difficult to determine if the rate is greater than, or similar to, toxicity associated with a 6- or 9-month regimen of isoniazid (INH).

These cases are being heavily investigated by the CDC and tuberculosis and liver disease specialists. Teams analyzed case reports and assessed current guidelines on the use of RIF-PZA, noting that the regimen had been well-tolerated in LTBI treatment trials among HIV-infected persons. The number of reports of severe liver injury among HIV-negative individuals was not anticipated. The investigation by the CDC is continuing to determine the correlation between RIF-PZA usage and risk factors for liver injury. It appears that underlying liver disease, including alcohol-induced hepatitis and previous INH-induced hepatitis, may predict toxicity with the RIF-PZA regimen. State and county public health officials are frustrated, since the short regimen has great promise for use in otherwise difficult-to-treat populations, such as those in alcohol treatment centers or jail.

Until further information is obtained, the conservative recommendation by the CDC, endorsed by the NC TB Control Program, is to avoid the two-month regimen of RIF-PZA in individuals at high risk for developing associated liver toxicity. This population includes the following:

- Persons taking other liver-toxic medications
- Persons with alcoholism, even if under control during treatment
- Persons with underlying liver disease of any kind (including hepatitis C or active hepatitis B)
- Previous history of INH-induced hepatitis

NOTES

Before individuals are placed on INH or RIF or PZA, they must be informed that liver toxicity can be caused by any of these medications. They must be taught to recognize the symptoms of liver toxicity, which include abdominal ("stomach") pain, nausea, vomiting, fever, malaise, yellow skin or eyes, or dark urine. If any of these symptoms appear, the patient must notify a health care provider and stop the medicines immediately. Finally, if a patient has difficulty speaking or understanding English, the treatment team must establish a link with someone who speaks the person's language and who can contact health care providers if there are problems.

For further information about LTBI treatment and RIF-PZA interactions, please contact the North Carolina Tuberculosis Control Program in the General Communicable Disease Branch at (919) 733-7286. ■

2001 West Nile Virus Activity in North Carolina

Prepared by WNV Core Team



West Nile virus (WNV) was first identified in North Carolina in a dead crow in the fall of 2000.

While there have been no human cases reported here to date, WNV was detected in sentinel chickens, mosquitoes and equines in 2001. Weather conditions here during the year were extremely dry, with most areas of the state experiencing rain deficits of 30-40 percent. Such dry conditions and the absence of tropical wet weather systems resulted in one of the lowest mosquito activity years in the last decade.

During the spring of 2001, the Division of Public Health established the WNV Core Team to address the potential public health threat of WNV and other mosquito-borne infections. The WNV Core Team developed and implemented a response plan and procedures with the following goals:

- Detection and monitoring;
- Education and outreach to the public and health care community;
- Ongoing communication regarding the current status of WNV activity; and
- Assistance with local mosquito control measures.

A copy of the WNV Response Plan and detailed information about WNV can be found at www.epi.state.nc.us/epi/oe/wnv.html.

During the 2001 mosquito season, the N.C. Department of Environment and Natural Resources - Public Health Pest Management (PHPM) Section, assisted by the N.C. State University Department of Entomology, increased mosquito-borne virus surveillance in the state. These activities significantly enhanced ongoing efforts initiated in 1994 to clearly define the enzootic and epizootic vectors of eastern and LaCrosse encephalitis, WNV and other arboviruses. Laboratory support for these efforts was provided by the State Laboratory of Public Health, Centers for Disease Control and Prevention (CDC - Fort Collins), and the University of Alabama-Birmingham.

Based on dead bird, sentinel chicken, and equine data, 2001 WNV activity in North Carolina occurred between early September and early November. These detections occurred in two defined areas – seven counties in the northern coastal plain (Camden, Chowan, Currituck, Hyde, Pasquotank, Pitt, and Tyrrell), and two counties in the south central piedmont (Cabarrus and Mecklenburg).

North Carolina recorded its first cases of WNV disease in equines during 2001, with a total of six resident horses confirmed as positive. The six diagnosed horses all originated from the northeastern portion of the state. Concomitant heavy WNV activity was reported in the southeastern Tidewater area of Virginia.

While there were no confirmed human cases of WNV illness, there was strong media interest in this virus, as evidenced by numerous radio, TV and print media interviews and a formal press conference when the first finding of WNV in North Carolina was confirmed. Communication was an important part of the state's WNV activities in 2001, when perceptions of the risks from an emerging virus were

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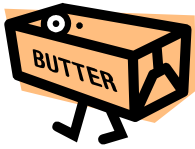
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in many ways more frightening than the actual risks to public health. To get information to the public, English and Spanish WNV brochures were developed and information was posted to the web.

For more information on WNV, visit the Division of Public Health's WNV website at www.epi.state.nc.us/epi/oe/wnv.html and Public Health Pest Management's web site at www.deh.enr.nc.us/phpm/pages/wnv_alert.html. ■

***E. coli* O157:H7 Outbreak in Robeson County**

*Prepared by Pam Jenkins, Food-Borne Disease Nurse
Epidemiologist, Communicable Disease Control Branch*



On November 28, 2001 both the State Epidemiology Section and the Robeson County Health Department were notified that several children in Robeson County had bloody diarrhea. By Dec. 3, laboratory evaluation of stool specimens from 11 sick children had yielded *E. coli* O157:H7. Local and state public health officials initiated active surveillance for diarrheal illness in Robeson County. By the end of the outbreak on Dec. 28, a total of 202 persons with gastrointestinal illness had been linked to this outbreak.

Preliminary investigation revealed that most of the ill were students at the same school. CDC, USDA, and state and local health department officials initiated the traditional three-pronged approach – a case-control study to identify risk factors for the infection, environmental investigation, and laboratory studies.

Case Control Study

A questionnaire was developed to determine clinical history and exposure to cafeteria foods and items served at two special events: a food tasting and a butter-making demonstration using unpasteurized milk. For this case-control study, cases were defined as bloody diarrhea or culture-confirmed infection in the identified school's student population, with onset of illness between Nov. 15 and Nov. 29. This definition was used to decrease the likelihood of including persons with illness caused by secondary transmission. Students who were without gastrointestinal illness after Nov. 15 were the control group.

Environmental Investigation

The school's staff and cafeteria employees were interviewed and the cafeteria kitchen and school restrooms were examined. Testing for *E. coli* O157:H7 was conducted on samples of ground beef from the school cafeteria freezer and hamburger patties and ground beef from the warehouse storing food supplies for Robeson County Schools. The retired teacher who held a butter-making demonstration at two schools was interviewed. His farm was inspected; samples were obtained from the water trough and manure, and rectal swabs were taken from the milking cows.

Laboratory Investigation

Human and environmental specimens were processed at the State Laboratory of Public Health. Stools were tested for Shiga toxin by enzyme-linked immunosorbent assay (ELISA) and cultured for multiple bacterial pathogens, including *E. coli* O157:H7, *Campylobacter*, *Salmonella*, *Shigella*, and *Yersinia*. When *E. coli* O157:H7 was identified, pulsed-field gel electrophoresis (PFGE) was performed to further characterize outbreak-related isolates.

Results

Consumption of hamburger (OR 4.65, CI 1.7-12.0, $p=.001$), string beans (OR 3.39, CI 1.02-11.2, $p=.037$), and homemade butter (OR 12.3, CI 3.4-44.3, $p<.0001$) were each associated with diarrheal illness. Stratified analysis was performed to control for exposure to butter, string beans, and hamburger. After controlling for butter exposure, the relationship between illness and consumption of hamburger (adjusted odds ratio of 3.49, CI 1.2-10.2, $p=.018$) or string beans (adjusted odds ratio of 2.09, CI .55-7.84, $p=.27$) became strikingly weaker than that between illness and butter consumption (adjusted OR 13, CI 3.37-50.4, $p<.0001$). We therefore concluded that the most probable cause of this outbreak was the butter made from unpasteurized milk.

E. coli O157:H7 was not detected in any of the meat products obtained from the school or the county warehouse. Although Shiga toxin was detected in manure specimens, *E. coli* O157 was not demonstrated in environmental samples from the butter-maker's farm. No samples of butter served at the school were available. No *E. coli* O157:H7 was cultured from milk or from recently made butter.

Stool samples were submitted for 131 (64%) of 203 suspect cases; *E. coli* O157 was isolated from 34 (26%). PFGE patterns are available for 32 isolates. Twenty-nine were found to be indistinguishable and were labeled Pattern A. Isolates from two children and one adult were distinct from each other and from Pattern A, and were labeled as Patterns B, C, and D. Pattern D was detected in a 25 year-old woman who was unrelated to the school community and who denied exposure to homemade butter. Therefore, she was not included in the outbreak.

Conclusions

This investigation highlighted the role of unpasteurized butter as a vehicle for *E. coli* O157:H7. Unpasteurized milk and milk products have been associated with outbreaks of numerous enteric pathogens, including *E. coli* O157:H7 and *Campylobacter*. The butter-maker in this community had been distributing his homemade butter for at least 40 years. However, given the emergence of *E. coli* O157 over the past two decades and the predominant availability of pasteurized milk, raw milk products should be avoided as they pose a threat to the public health, particularly that of young children. ■

Sixth-Grade School-Site Hepatitis B Immunization Initiative: School Year 2000-2001

*Prepared by Patricia Poole, Hepatitis B Coordinator
NC Immunization Branch*



For the sixth year, North Carolina sixth-graders rolled up their sleeves for hepatitis B vaccine. Many vaccine-preventable diseases, including hepatitis B infection, continue to affect adolescents and young adults. School-site immunization clinics provide a unique opportunity to vaccinate adolescents before the age when they are at greater risk of exposure to the hepatitis B virus. The adolescent population averages less than one health care visit each year, so this initiative

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offers the best hope for completing the recommended vaccines over a six month period, and it is flexible and convenient for parents.

Of the 150,000 people who contract hepatitis B each year in the United States, an estimated 4,000 die of hepatitis B-related cirrhosis and 1,500 die of hepatitis B-related liver cancer. Experts also estimate that approximately 70% of hepatitis B infections occur in late adolescence and early adulthood. Infant and adolescent vaccination programs have been very successful, but the reduction of hepatitis B-related liver disease will not be realized until these vaccinated children reach adulthood. Hepatitis B is transmitted through contact with body fluids and is 100 times more contagious than HIV infection. Hepatitis B infection can be prevented through the administration of the hepatitis B vaccine, which has been shown to be very safe when given to infants, children or adults. Measles-mumps-rubella (MMR), tetanus-diphtheria (Td) and varicella have also been recommended as routine vaccinations for children entering sixth grade.

Background

In **1995**, the North Carolina Immunization Branch launched a statewide initiative to provide hepatitis B vaccinations to all sixth-graders at school-based clinics. Ninety-nine counties participated in the initiative. The North Carolina Immunization Branch reimbursed local health departments for providing immunization service at \$2 per injection for hepatitis B, MMR, Td and varicella vaccines.

In **1996-97**, the initiative expanded criteria to include vaccines for other preventable diseases, such as measles, mumps, rubella, tetanus, diphtheria and varicella vaccines. The fragile storage temperature for varicella vaccine prevented school-based clinics from offering that vaccine statewide.

In the **1999-2000** school year, a drop in the participation rate was noted. Data were insufficient to determine the number of sixth-graders who were in the process of, or had already received, the hepatitis B vaccination series elsewhere. Overall data reveals 65 % of the *total* sixth-grade students, and 97% of the *eligible* sixth-grade students, participated in this initiative by receiving the first dose of hepatitis B vaccine. The completion rate was 92% for participating students who began and completed the series, which is consistent with the completion rates of previous years.

All 100 counties have participated in the initiative since school year 1996-97. Table 1 summarizes each year's Sixth-Grade School-Site Immunization Initiative since 1995.

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Table 1. Summary of the North Carolina Sixth-Grade School-Site Immunization Initiative

SCHOOL YEAR	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001
Total Number of Students	88,553	93,506	96,833	94,938	102,358	108,134
*Participation Rate	74 %	70 %	72 %	72 %	65 %	61 %
Total Students Who Began/ & Completed HB Series	62,493	63,892	64,814	63,886	61,537	61,816
Completion Rate	95 %	95 %	92 %	92 %	92 %	93 %
Total Number of HBV Doses Administered	191,550	192,312	192,312	198,447	194,599	192,409
Doses of MMR	N/A	23,952	26,462	22,724	17,706	1,833
Doses of Td	N/A	19,832	24,559	26,601	23,556	23,650
Immunization Branch Incentive Cost	\$383,100	\$459,940	\$434,608	\$419,204	\$302,716	\$368,269

*Participation rate is based on the number of students who received the first HB dose compared to the total number of sixth-grade students.

Objectives

The goal of the **2000-2001** Sixth-Grade School-Site Immunization Initiative was to vaccinate at least 70 % of North Carolina's sixth-graders against hepatitis B. In addition, local health departments offered MMR and Td vaccines in the school-based clinics to enhance this initiative.

Methods

The statewide initiative was developed to provide hepatitis B vaccine to sixth-grade students in public and private schools. As an incentive, the North Carolina Immunization Branch reimbursed local health departments for providing immunization services at \$2.72 per dose for the first and second doses and at \$1.66 per dose for the third dose of hepatitis B vaccine.

Results

For the fifth year in a row, all 100 counties participated in the Sixth-Grade School-Site Hepatitis B Immunization Initiative in **2000-2001**. Many students entering sixth grade in 2000-2001 received two doses of measles-containing vaccine prior to starting kindergarten/first grade; therefore, the rate of students receiving MMR declined as compared to previous years. Of the 108,134 sixth-graders, 61,816 (57%) received three doses of hepatitis B vaccine, 1,833 (1.7%) students received MMR vaccine and 23,650 (22%) received Td vaccine in the school-site clinics.

This year, 192,409 doses of hepatitis B vaccine were administered to sixth-graders. A total of 69,934 (65%) sixth-graders received parental consent and thus were *eligible* for vaccination.

LHDs report increasing numbers of children are receiving hepatitis B vaccinations elsewhere. Data were insufficient to determine the number of sixth-graders who were in the process of, or had already received, the hepatitis B vaccination series elsewhere. Overall data reveal 61% of the *total* sixth-grade students, and 94% of the *eligible* sixth-grade students, participated by receiving the first dose of hepatitis B vaccine in this initiative. Ninety-three percent of the participating students completed the three-dose series. The North Carolina Immunization Branch funded \$368,269 in program incentives for this initiative.

Conclusion

The Sixth-Grade School-Site Hepatitis B Immunization Initiative continues to successfully provide a unique opportunity for routine immunization of adolescents before exposure to hepatitis B occurs, generally through unprotected sex or intravenous drug use. This initiative offers parents a viable solution for ensuring their adolescents receive these recommended vaccinations. It should be noted that these results **do not** reflect the number of sixth-grade students who receive vaccines from private health care providers.

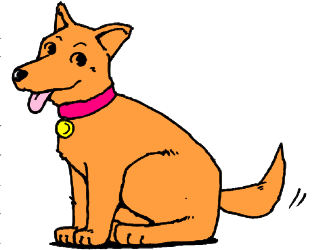
For more information about this initiative, contact:
Patricia T. Poole, R.N., Hepatitis B Coordinator, NCDHHS, DPH, WCHS, Immunization Branch, 919-715-6777. ■

Tracking Down a Suspected Rabies Case

Prepared by Lee Hunter, D.V.M., M.P.H., Public Health Veterinarian, and Rick Langley, M.D., M.P.H., Medical Epidemiologist; Occupational and Environmental Epidemiology Branch

On Thursday, Dec. 13, 2001 the N.C. DHHS Veterinary Public Health Program received notification from the Massachusetts Department of Public Health (MA DPH) of a dog that had tested positive for rabies. The dog, a Yorkshire terrier puppy, had become ill several days previously with neurological illness and odd behavior.

The puppy had been purchased in North Carolina from a Wilkes County breeding facility on or about Nov. 29. The new owner and the puppy visited friends and relatives in North Carolina before returning to Massachusetts on or about Dec. 2. The dog stopped eating and began behaving oddly on Dec. 6.



After it bit a veterinarian in Massachusetts, the animal was euthanized, submitted for rabies testing, and found to be positive for rabies. Investigation by the MA DPH revealed the link to North Carolina.

The Wilkes County Department of Health and Wilkes County Animal Control were notified on Dec. 13 and began a local investigation. The breeder provided information about purchasers of the only other two puppies from the same litter and voluntarily agreed to temporarily stop sales of other dogs. The dam (mother dog) and one puppy were located and euthanized, and both tested negative for rabies on Friday, Dec. 14. Unfortunately, the identifying information about the other new owner was minimal and included only his name and ZIP code. An intensive search for that owner and the puppy was launched.

The North Carolina investigation determined that several people in Wilkes County, including the breeder, were also possibly exposed to rabies. Additionally, 8 people in a neighboring county had contact with the first puppy during its visit to a local business. Most of those elected to receive post-exposure rabies treatment. Following the investigation in Massachusetts, the veterinarian, several of his employees, the dog's owner and several other people also requested post-exposure rabies treatment.

Efforts to locate the owner of the remaining puppy involved the Wilkes and Forsyth County sheriffs' departments as well as Wilkes and Forsyth county health departments. Door-to-door canvassing was done in the ZIP code given by the missing owner. Stories were broadcast on the regional media outlets seeking that owner. The last puppy was finally located on Saturday, Dec. 15. The animal was euthanized and tested negative for rabies that day at the State Laboratory of Public Health in Raleigh.

The MA DPH reports that the virus from the puppy with rabies is a variant most commonly associated with raccoons in the eastern United States. Neither the owner nor the breeder reports knowledge of any possible contact with a wild animal that could have resulted in disease transmission.

(continued on page 10)

(continued from page 9)

This case demonstrates that, though rabies is no longer in epidemic levels in the wildlife of North Carolina, the virus continues to show its presence. Veterinarians should keep rabies on their diagnostic rule-out list when presented with cases exhibiting neurological signs of disease. Physicians should consider the need for post-exposure rabies prophylaxis when a patient presents with a bite from an animal. A physician attending a person bitten by an animal known to be a potential vector of rabies must report the bite to the local health director within 24 hours.

The North Carolina Division of Public Health can provide assistance to medical professionals considering the need for post-exposure rabies prophylaxis in a patient. The contact number is (919) 733-3410 during working hours or (919) 733-3419 during holidays, weekends and after normal working hours.

Additionally, both written and electronic educational materials about rabies are available free of charge from the Division of Public Health. Extensive information is available on the Veterinary Public Health website at www.schs.state.nc.us/epi/rabies.html. Now in production is a CD-ROM containing a web-based program with materials for review and printing. This CD allows the user to view the materials through any web browser, regardless of the computer operating system (the free Acrobat Reader is needed to view many of the articles included). Also included on the CD is a Windows-based computer program that may be installed on a PC. The program, **What the Primary Care Physician Needs to Know About Rabies**, was written to provide physicians and public health professionals in-depth education about rabies, the reasons for its return and spread across the state and a thorough review of animal bite case management including post-exposure rabies prophylaxis. Free copies are available from the telephone numbers given above, fax (919-733-3410) or e-mail (vetpublichealth@ncmail.net). Some of the resources on the CD are also available on the website mentioned above. ■

Ethiopia Technical Providers

*Prepared by Brenda Crowder Gaines, Unit Manager,
Prevention & Community Planning
HIV/STD Prevention & Care Branch*

I am fortunate enough to be a part of the National Association of State and Territorial AIDS Directors (NASTAD) Global Team for Ethiopia. The adult population of Ethiopia has been devastated by AIDS, and many children have been orphaned. Ethiopia has received funding from the World Bank and various other organizations for AIDS work, and the country is trying to reduce its rates and numbers of HIV infection. The focus populations seem to be orphans, commercial sex workers and truck drivers.

The members of the Global Team are from Texas, Delaware, Washington state, Michigan and NASTAD. We were in Ethiopia for two weeks meeting with the Ministry of Health, National AIDS Secretariat, national and regional AIDS Councils, Family Health International, other governmental and non-governmental agencies, the agency for Persons Living with AIDS, and other community organizations.

I and the team members from Texas and Delaware were charged with providing training on the components of, and how to develop, a plan using community planning guidance. The training was attended by about 30 individuals from these agencies, the hospital and community partners.

My first morning in Ethiopia, the poverty factor and the lack of infrastructure development struck me. What I felt was an emptiness in the area. I felt so sorry for the people. Boy! Was I in for a surprise.

The people are so gracious, sharing and kind, that you overlook the sad state of buildings, roads and offices. They were so pleasant and eager to receive what information we were willing to give, that we learned to overlook the fact that most offices had no phones or that they were the rotary type. The folks were so willing to work to ensure that they made a difference in their community, that we overlooked the lack of computers to assist them in their work. (Nowadays, how can one survive without e-mail? UM!)

A voluntary counseling and testing (VCT) center was scheduled to open in December, 2001. During the two weeks I was in the country, I saw the center transform from what looked like burned-out trailers and an empty building to brightly painted trailers to be used as waiting rooms, and office space with new furniture and a computer.

Lessons learned:

1. Efficiency does not mean better.
2. Whatever you think you can teach somebody, they can teach you more.

This was a wonderful experience that has changed me forever, and I am thankful for that change. ■

Employee Recognition: Brenda Horne Employee of the Quarter

*Prepared by Patsy West, Administrative Assistant
Epidemiology Section*



Ms. Brenda Horne has received the Epidemiology Section's Employee Recognition Award for the winter quarter. She was nominated in the category of Teamwork.

In 1988, Ms. Horne began her state government career in the Vital Records Branch. A year later, she transferred to the General Communicable Disease Branch, where she is now Branch Office Manager.

In addition to duties such as ensuring phone coverage for the Branch, ordering supplies and equipment, making sure time sheets are properly completed or the many other duties related to a smoothly operating office environment, Ms. Horne has a genuine knack for interacting with people. Whether the task at hand is procuring office space for the Branch or having phones installed, she can be counted on to get the job done. For example, in spite of the budget crunch, Ms. Horne was able to obtain many rooms of surplus office furniture recently for three of the four branches in the Epidemiology Section.

Ms. Horne manages to get her work done while still relating to her co-workers and customers in a warm and friendly manner. The Epidemiology Section is very fortunate to have Brenda Horne as part of the team.

In addition to receiving the Employee Recognition Award for Teamwork, she will be presented with a gift certificate from the Section Management Team. ■

Reported Communicable Diseases, North Carolina, January-December 2001 (by date of report)*

Disease	Year-to-Date (Fourth Quarter)			4 th Quarter 2001	Comments / Note
	2001	2000	Mean (96-2000)		
Brucellosis	2	3	2	2	
Campylobacter	472	533	549	107	
Chlamydia, laboratory reports	22177	22176	19674	5520	
Cryptosporidiosis	31	28	-	8	Note 1 & 2
Dengue	2	3	14	1	
E. coli O157:H7	58	93	95	23	Note 3
Ehrlichiosis, Monocytic	11	11	-	2	Note 1 & 2
Encephalitis, California group	6	7	-	4	Note 1 & 4
Foodborne, other	9	11	34	2	
Foodborne, staphylococcal	2	2	20	2	
Gonorrhea	16734	17996	18352	3814	
Haemophilus influenzae	50	23	26	9	
Hepatitis A	241	154	173	84	
Hepatitis B, acute	222	256	265	61	
Hepatitis B, chronic	648	636	665	183	
Hepatitis C, acute	22	20	12	6	Note 1 & 4
HUS-TTP	2	2	-	1	Note 1 & 2
HIV/AIDS	1601	1467	1559	378	Note 5
Legionellosis	11	16	14	4	
Leptospirosis	1	1	1	1	Note 8
Listeriosis	6	-	-	4	
Lyme disease	41	47	57	8	
Malaria	19	36	31	7	
Meningococcal disease	63	39	65	4	
Meningitis, pneumococcal	51	50	52	13	
Mumps	5	9	14	1	
Rabies, animal	577	571	637	118	
Rocky Mountain Spotted Fever	185	78	125	64	
Salmonellosis	1380	1149	1296	400	
Shigellosis	356	400	387	73	
Strepto. A, invasive	146	88	27	21	Note 2
Syphilis, total	943	1101	1523	219	Note 6
Tetanus	2	0	1	1	
Toxic Shock Syndrome	8	5	2	4	
Tuberculosis	398	447	174	147	
Tularemia	1	2	2	0	
Typhoid Fever	3	3	2	1	
Vibrio vulnificus	6	2	-	2	Note 7
Vibrio, other	12	9	-	4	Note 2
Vanco. Resistant Enterococci	557	434	-	111	Note 2
Whooping cough	74	129	130	19	

* Preliminary data, as of 2/14/2002. Quarters are defined as 13-week periods.

Notes: 1. - =Not reportable in this entire time period; 2. Became reportable 8/1/1998; 3. Became reportable 10/1/1994; 4. Became reportable as such 8/1/1998; previously within other category ("Encephalitis"; and "Hepatitis, non A-non B"); 5. Earliest report with HIV infection or AIDS diagnosis; 6. Primary, secondary and early latent syphilis; 7. Became reportable 7/1/1997; 8. Became reportable 7/2001.

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